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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,018	02/11/2004	Jingsheng Chen	17184-002001 / E.20040013	2232
26161	7590	08/10/2005	EXAMINER	
FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			JOLLEY, KIRSTEN	
			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/777,018

Applicant(s)

CHEN ET AL.

Examiner

Kirsten C. Jolley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11-17 is/are rejected.
- 7) ☒ Claim(s) 9 and 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restriction*

1. Applicant's election without traverse of claims 1-17 in the reply filed on May 27, 2005 is acknowledged.

### *Claim Objections*

2. Claim 2 is objected to because of the following informalities: In claim 2, line 2, "after crystallized" is awkward language; the Examiner suggests replacing "crystallized" with – crystallization--. Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-2, 4, and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Lamberton et al. (US 2005/0084668).

Lamberton et al. discloses a method for forming a thin film magnetic recording medium comprising the steps of: generating magnetic nanoclusters (paragraph 0034); crystallizing the

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magnetic nanoclusters; and depositing the magnetic nanoclusters onto a substrate to form a thin film of magnetic particles thereon (paragraph 0035). It is known that the magnetic nanoclusters that are formed are crystallized because the magnetic metal nanoclusters are formed by heating the metal material (Fe, Co, Mn, or Ni – paragraph 0027) until it evaporates into vaporized metal. Such a temperature would inherently cause the metal clusters that are formed to be crystallized.

As to claim 2, the magnetic nanoclusters are deposited onto the substrate after they are crystallized in Lamberton et al.'s process.

5. Claims 1-3, 5-6, 11, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Ryonai et al. (US 6,242,085).

Ryonai et al. discloses a method for forming a thin film magnetic recording medium comprising the steps of: generating magnetic nanoclusters (col. 4, lines 3-12); crystallizing the magnetic nanoclusters; and depositing the magnetic nanoclusters onto a substrate to form a thin film of magnetic particles thereon. It is known that the magnetic nanoclusters that are formed and deposited are crystallized because col. 6, lines 37-39 refers to the magnetic particles as *magnetic crystals*.

As to claims 2-3, it is the Examiner's position that the crystallization occurs prior to deposition because Ryonai et al. teaches that the substrate temperature may be room temperature, and Ryonai et al. does not teach a further heating step (col. 6, lines 30-40).

As to claims 5 and 16, Ryonai et al. teaches that the magnetic nanoclusters are mixed with a non-magnetic material (col. 4, lines 13-22). As to claim 6, while Ryonai et al. does not specifically state that the non-magnetic material encapsulates the magnetic clusters, Ryonai et al.

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teaches that multiple layers of the mixed magnetic clusters and non-magnetic material may be applied on top of one another (col. 4, lines 30-40). Such a multi-layer structure would result in some magnetic nanoclusters that encapsulated with non-magnetic material because the clusters in one layer would not fall perfectly in line with the clusters in the layer beneath it.

6. Claims 1-2, 5-8, 11-12, and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Ejiri (US 2004/0115480).

Ejiri discloses a method for forming a thin film magnetic recording medium comprising the steps of: generating magnetic nanoclusters (paragraph 0019); crystallizing the magnetic nanoclusters; and depositing the magnetic nanoclusters onto a substrate to form a thin film of magnetic particles thereon. It is known that the magnetic clusters that are formed and deposited are crystallized because the table in paragraph 0045 refers to the *crystallite size* of the magnetic particles.

As to claims 5-8 and 16, the clusters in the magnetic layer are mixed and encapsulated with non-magnetic material, including a solvent and surfactant (see table in paragraph 0045, as well as paragraphs 0035-0036); the magnetic clusters and non-magnetic material in the magnetic layer are deposited together.

As to claim 12, Ejiri teaches providing a magnetic field adjacent to the substrate to control the orientation of the magnetic particles upon deposition (paragraph 0040).

***Claim Rejections - 35 USC § 103***

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7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lamberton et al.

As to claim 3, Lamberton et al. does not teach that the substrate is heated during deposition. It would have been obvious for one having ordinary skill in the art to have *not* heated the substrate during deposition since Lamberton et al. lacks a teaching of heating.

As to claim 17, Lamberton et al. lacks a teaching of rotating the substrate during deposition. It is the Examiner's position that it would have been obvious for one having ordinary skill in the art to have rotated the substrate during deposition of the nanoclusters in order to ensure that the nanoclusters are evenly adhered to the substrate surface, and that deposition is not thicker on one side versus another.

9. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ryonai et al.

Ryonai et al. lacks a teaching of rotating the substrate during deposition. It is the Examiner's position that it would have been obvious for one having ordinary skill in the art to have rotated the substrate during deposition of the nanoclusters in order to ensure that the nanoclusters are evenly adhered to the substrate surface, and that deposition is not thicker on one side versus another.

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10. Claims 3, 13-15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ejiri.

As to claim 3, Ejiri does not teach that the substrate is heated during deposition. It would have been obvious for one having ordinary skill in the art to have *not* heated the substrate during deposition since Ejiri lacks a teaching of heating.

As to claims 13-15, Ejiri teaches controlling the orientation of the magnetic particles upon deposition on the substrate (paragraph 0040). Ejiri lacks a teaching of providing each particle with an easy axis parallel to a surface of the substrate or an easy axis perpendicular to the a surface of the substrate. However, Ejiri states that the orientation direction may be the longitudinal direction, in-plane direction, vertical direction or width direction. Therefore, it would have been obvious for one skilled in the art to have selected either the perpendicular or parallel directions as the orientation direction since Ejiri teaches that the direction is not critical.

As to claim 17, Ejiri lacks a teaching of rotating the substrate during deposition. It is the Examiner's position that it would have been obvious for one having ordinary skill in the art to have rotated the substrate during deposition of the magnetic layer because spin coating is a well known method used for coating substrates to achieve a uniform coating thickness, particularly magnetic recording mediums, and because Ejiri states that "The magnetic layer may be coated by a known method" (paragraph 0040) and is not limited to the types of coating methods that may be used.

*Allowable Subject Matter*

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11. Claims 9-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not teach or fairly suggest the steps of generating magnetic nanoclusters, then mixing the nanoclusters with a non-magnetic materials, followed by then crystallizing the magnetic nanoclusters (by heating), and depositing the magnetic nanoclusters on a substrate to form a thin film of magnetic particles thereon.

### *Conclusion*

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Watanabe et al. (US 2003/0235718) and Sun et al. (US 2004/0134565) are cited to demonstrate the state of the prior art.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten C. Jolley whose telephone number is 571-272-1421. The examiner can normally be reached on Tuesday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kirsten C Jolley  
Primary Examiner  
Art Unit 1762

kcj